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THE BREAD AND MEAT OF THE WORLD.*

BY YVES GUYOT.

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I. THE NECESSARY RATION.

In the United States the experiment stations of the Department of Agriculture, about ten years ago, began, under the direction of Mr. A. C. True, an investigation into the nutritive value of different foods and their comparative prices. These investigations were conducted by Mr. W. O. Atwater, assisted by collaborators of the first rank.† Following his study entitled the "Principles of Nutrition and Nutritive Value of Food," I wish to state the conditions of human nourishment. The human body is composed of

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*Translated from *Revue du Commerce, de l'Industrie et de la Banque*, Oct. 1, 1904.

†Published by the Department of Agriculture.

from 15 to 20 elements, first among which are water and the mineral elements, such as phosphate of lime, which is the foundation of bone.

Then come, forming 18 per cent. of the average weight of the body of an average man, the protein substances, divided into two groups: (1) those albuminoids contained in substances like white of egg, lean meat, casein of milk, gluten of wheat; (2) the gelatinous substances, which form chiefly the connecting tissues, such as the tendons, the skin, and the periosteum of the bone. These elements constitute the human body. They serve also as fuel, for they are burned to produce energy, and are again transformed into fat.

Sugar and starch may equally be stored up as fat in the body. Fat makes up 15 per cent. of the weight of an average man.

The hydrates of carbon include starch, sugar, cellulose, and are found particularly in milk, cereals, and potatoes; but the hydrates of carbon form only 1 per cent. of the tissues of the human body. Sugar and starch furnish a vast amount of energy, and are easily transformed into fat.

There is some waste in foodstuffs, such as meat bones, fish bones, egg shells, and the skins of fruits, which are not edible.

The function of food is: first, to furnish the materials of the body and to repair its waste; second, to maintain the heat of the body and produce the power used in action. By means of a calorimeter the amount of energy calculated in calories, expended by man, can be measured. A calorie is understood to be the amount of heat necessary to raise the temperature of a kilogram of water one degree centigrade, which, translated into terms of mechanics, equals 423.5 kilogram-metres. An adult produces in twenty-four hours about 2,400 calories, about a hundred an hour. He loses, moreover, from 1,300 to 1,350 cubic centimetres of water through the kidneys, 700 cubic centimetres through the skin, and 450 through the lungs. He exhales a quantity of carbonic acid, containing 610 to 690 grams of oxygen and 230 to 260 grams of carbon. He throws off nearly 240 to 270 grams of this vast element through various excretions. He loses through the bowels and kidneys 22 to 23 grams of mineral salts, of which more than half is sea salt.* The ration for subsistence requires, therefore, foods furnishing an equivalent to what is expended, but for work a larger ration is necessary. Atwater gives the following estimates of necessary rations:—

For a Person having	Protein Substances.		
	Total Grams.	Digestible Grams.	Calories.
No physical exercise	90	83	2,450
Moderate exercise	112	103	3,050
Moderately active exercise	125	115	3,400
Hard physical labor	150	138	4,150
Very hard physical labor	175	161	5,500

These figures are certainly not exaggerated. According to some experiments made in Scotland on prisoners employed in breaking rock, and working eight hours a day, Dr. Dunlop finds that 3,700 calories are necessary for an adult doing only moderately active work.

II. THE RATION OF THE FRENCH SOLDIER.

In times of peace the actual ration of the French soldier is 750 grams of bread, 300 grams of meat, not counting vegetables, sugar, and coffee. Besides the regulation bread distributed by the State, there is the bread bought with soup at the baker's, at a rate of 125 grams per portion of soup.

The two portions of soup a day under the old régime, now discarded, were equivalent to 250 grams; and the allowance of bread was increased to 1 kilogram.

By ration is here meant the ration of untrimmed meat.

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*" L'Alimentation," by Armand Gautier.

The usable meat given out to the troops contains hardly more than 35 per cent. of assimilable matter,—about 100 grams out of 300.

The regular campaign ration is 750 grams of bread, 400 grams of fresh meat or 240 grams of salt pork or 200 grams canned meat, 60 grams dried vegetables or rice, 30 grams lard or 25 grams condensed soup, 20 grams salt, 21 grams sugar, 16 grams roasted coffee, 0.25 litre wine.

The ration for a hard campaign consists of 500 grams fresh meat or 300 grams salt pork or 250 grams canned meat, 30 grams sugar, 24 grams roasted coffee. We should compare the ration of the French soldier in time of peace with that of a man doing moderate physical labor:—

	Protein Grams.	Calories.	Rate of Nutrition of the Ration.
Eaten	125		
Digestible	103	3,400	6.2

Ration of a French soldier:—

Meat with an average of 15 per cent. of protein matter × 300 grams = 45 grams.

Bread or a substitute: 10 hectos. × 9.2 = 92 grams,—a total of about 137 grams of absorbed protein substances.

Our figures are a little above those given by Atwater for a man engaged in moderate physical labor; but he attributes only 16 to 20 per cent. of waste to meat, and we have found that one should reckon it to be 35 per cent. for the meat furnished the troops.

In calories:—

300 grams of meat	=	666
1,000 grams of white bread	=	2,660
		3,326

$$\text{Quarter of the ration of sugar, } \frac{10 \text{ grams}}{4} = 2.5 \text{ grams}$$

gives for 1,750 calories per English pound, 9 calories.

Some vegetables must be added; but one can hardly reach the number of 3,400 calories, which should be regarded as rather below than above the necessary amount.

III. RATION NECESSARY FOR THE FRENCH PEOPLE.

In the "Essai d'arithmétique politique sur les premiers besoins de l'intérieur de la République," published in 1796, the celebrated mathematician, Lagrange, designated animal food as "butcher's meat," pork included; while the ordinary cereals, including wheat, rye, and barley, he grouped as grain.

As the basis for his estimates, he took the military ration, which for each soldier was 28 ounces of bread (1¾ pounds) and half a pound of meat.

But how does he estimate for the whole population? "In a family composed of husband, wife, and three children under ten years of age, the father alone consumes nearly as much as the rest of the family."

Estimating one-fifth of the population to be under ten years of age, he holds that the consumption of this fifth counterbalances the smaller consumption of the women as compared with that of the men; and, having still to account for the diminished consumption of old people, he concludes that the total consumption of all the inhabitants of France should represent only four-fifths of the consumption of an equal number of soldiers. Lagrange thus arrives at the figures of 20 millions out of 25 millions of inhabitants.

Following the example of Lagrange, I take as typical the ration of the soldier in time of peace. In order to ascertain the reduced consumption among children under 15, women from 15 to 59, inclusive, and old people above 60 years of age, I have divided the population of the different ages into large groups, according to the censuses of 1876 to 1896, and increased the number of individuals of reduced consumption. Thus out of 1,000 persons I estimate 20 per 1,000, although the number of children is only 16 per 1,000 under 1 year.

For 1,000 persons of both sexes we have:—

Under 1 year	20
From 1 to 14 years, inclusive	260
From 15 to 59 years	600
60 years and over	120
	1,000

Some physiologists estimate that the nutriment required by a woman equals three-fourths of that required by a man; that the nutriment needed by an old person can be compared to that for a woman. I have left wholly out of consideration the nutriment of children under the age of one year.

Under these conditions the figures for rations of food per 1,000 inhabitants will be:—

For men	300
For women and old persons	315
For children	195
Total	810

In round numbers the figures for the rations of adults represent four-fifths of the total population. Population enumerations and recent observations on the proportions of nutrition give exactly the same figures as those obtained by Lagrange.

Atwater has established by experiments the following proportions:—

Man doing moderate physical work	1
Man doing hard physical work	1.2
Man doing light physical work and children from 15 to 16 years	0.9
Man doing sedentary work; woman doing moderate physical work; boy of 12 years; girl of 13–14 years	0.8
Woman doing light work; boy of 12 years; girl from 13–14 years	0.7
Boy of 10–11 years; girl of 10–12 years	0.6
Child of 6–9 years	0.5
Child of 2–5 years	0.4
Child under 2 years	0.3

These figures approach the proportions determined by Lagrange and myself. But I reduce the proportion of a fifth to a quarter; and, if, to simplify the computation, I carry the population of France to the number of 40 millions instead of 30, I have a total of 39 millions instead of 31,200,000.

Through the tax of 7 fr. on grains, of 20 fr. on the metrical hundred weight of live cattle, of 25 fr. on the hundred weight of live mutton, which brings the tax on the net weight of butcher's meat to 35 fr., the land-owners have secured the monopoly of furnishing bread and meat for the French population.

In what measure can they provide for it?

IV. BREAD.

The question is often asked, How many kilos of bread are produced from 100 kilos of flour? The reply is simple. 100 kilos of flour give 100 kilos of bread. The remainder is water. Thus the "Notices sur le service des subsistances militaires" estimate the production of flour from new wheat, bolted at 20 per 100, at 139.5 kilos of bread (p. 483). This shows that there is too much water in the military ration of bread. Moreover, the boltage is weak. Aimé Girard and Fleurent have proved that, to be wholly nutritive, bread should be made entirely from the kernel of the grain, the flour from which represents from 55 to 65 per 100 of its weight. In the time of Lagrange one pound of bread was estimated to one of wheat. "Wheat," he said, "loses in the grinding, as the removal of the bran takes from it a fourth of its weight; but the flour gains back a third of its weight when it is made into dough by adding water, a part of which remains in the bread." Since we have taken the military ration as a type, let us regard it from the point of view of production, according to the formula that 100 kilos of wheat equal 100 kilos of bread, although there is an increase through the process of bolting.

According to the *Enquête agricole* of 1892, we find that the department representing the greatest excess in production of wheat in proportion to its population is Eure-et-Loir, which had 906 hectolitres per 100 inhabitants. If I convert the hectolitres into quintals of 77 kilos each, I get a total of 697.62 quintals. But only 75 out of 100 inhabitants need to be provided with a ration of a kilo a day. The proportion is thus increased by a fourth and brought up to 883 quintals per 100 inhabitants, or 883 kilos per each inhabitant. But the typical ration gives us 360 kilos a year. There is thus an excess of 523 kilos a year. The same calculation made for the other departments would prove that every department that does not produce at least 3½ hectolitres per inhabitant is condemned to unsufficient nourishment or must import it from districts which produce a much greater quantity. But there are 43 districts out of 87, or about half, of which this is true (*Statistique agricole*, 1892, the harvest in that year yielding 117,500,000 hectolitres). The average production of wheat from 1892 to 1903 was about 88,144,000 quintals. I have not deducted from this the 5 or 6 million quintals used for industrial purposes. I do not take for granted, moreover, that there is a certain amount of it used as fodder, and have deducted only the quantity necessary for seed. According to the work of Mr. C. V. Garola, director of the Agricultural Station of Chartres, *Les Céréales* (1894), an average of 206 litres of wheat is sown to the hectare, which, at a weight of 77 kilos per hectolitre, is equal to 160 kilos per hectare.

The average area of land sown in wheat from 1892 to 1903 was about 6,563,000 hectares, which gives us 10½ millions quintals. Thus 77,644,000 quintals are available for food,—in round numbers, 78,000,000.

We have then, according to the formula given above, 1 kilogram of bread per day = 360 kilograms of bread per year × 30,000,000 of rations = 10,800,000 tons, and, consequently, a deficit of 3,000,000 tons of wheat, nearly 29 per 100 inhabitants. It is true that there are some inferior grains which are used in part for food. According to the figures for 1902, rye yielded 1,159 tons; barley, 947,000 tons. Yet they hardly entered directly into the nutritive ration. Buckwheat yielded 578,000 tons, but it represents the poorest kind of nutrition.

The crop of potatoes was in 1902 about 11,200,000 tons; but it can be estimated that 5,000,000 were used for animal fodder, industrial purposes, distillation, and seed. On the other hand, according to the table given by Mr. Armand Gautier, out of 100 parts of new wheat the French and foreign wheats give on an average 12.64 of albuminoid matter; potatoes, 1.3. In short, to obtain the same quantity of albuminoids, 972 tons of potatoes are necessary as against 100 tons of wheat. To obtain the equivalent of protein substances furnished by 1,000,000 tons of wheat, 9,720,000 tons of potatoes are required. There were lacking 3,000,000 tons in the wheat crop, or 29 per 100. Counting the barley and buckwheat as equal to wheat, we have 1,000,000 tons of these poorer grains. Potatoes give an equivalent of less than a million. But the addition of these figures still leaves a deficit of a million, or about 10 per 100.

Vegetables ought to be considered separately; for in the military ration they are added to the bread, and do not take its place.

The crop of beans in 1902 was about 96,000 tons; of lentils, 84,000; of peas, 53,000; of French beans, 92,000,—a total of 325,000 tons. All these vegetables, not counting the waste, contain an enormous quantity of water. They cannot be regarded as the equivalents of wheat of the same weight.

Notwithstanding all the substitutes used by the French for wheat, the best proof that they need foreign grain is that they have continued to import it after the duty of 7 fr. was imposed in 1894.

	Grains *Tons.*
1895	450,000
1897	526,000
1898	1,945,000
1899	130,000
1902	245,000
1903	465,000

When crops are abundant, the tax plays only a limited part. As competition grew in the interior, the market price broke. But, as soon as a shortage in grain was apprehended, prices rose in the protected countries to a degree which sent the price of the commodity way beyond the natural rate.

Here is the proof borrowed from the *Memoranda of the Board of Trade,* published in 1903:—

Prices per quarter in	*United Kingdom.*	*France.*	*Germany.*	*United States.*
		(Shillings and pence.)		
1882	45.1	44.11	45.4	44.0

English and German prices are higher than prices in France were during the last year of free trade (namely, 1861), when the duty of 60 centimes per 100 kilos was imposed. In 1883 the tax was raised to 3 fr. We find the following prices:—

United Kingdom.	*France.*	*Germany.*	*United States.*
41.7	44.3	40.3	38.6

The price of wheat fell; it fell in England, the United States, and Germany, the difference being in our favor in 1882 compared with the price in Great Britain: it is now to our loss by nearly 3*s*.

In 1887 the tax was raised to 5 fr. in France, and in Germany to 5 marks per 100 kilos. We find the following prices:—

United Kingdom.	*France.*	*Germany.*	*United States*
31.10	43.9	37.11	31.9

In 1894 we had a duty of 7 fr., and Germany lowered its tariff to 3 marks 90 pf. It resulted in the following differences:—

PRICES IN

	United Kingdom.	France.	Germany.	United States.
	s. d.	*s. d.*	*s. d.*	*s. d.*
1895	23.1	32.9	30.6	22.4
1897	30.2	43.9	36.0	31.1
1898	34.0	45.8	40.6	31.9
1902	28.1	38.0	35.9	27.1

The tax of 7 fr. per metric quintal equals per imperial quarter 12*s.* 2½*d.*

It is seen that in 1897, a year of bad crops, the tax had more than its full effect, the difference being 30.2 and 43.9, or 13*s.* 7*d.*

May 4, 1898, M. Meline suspended the tax of 7 fr. on grains. In the report which preceded the decree he said, "In a few days we have seen the price of wheat rise from 30 to 33 and even 34 fr."

May 1, 1903, the price of wheat in Paris was 25 fr.; in London, 16.50; in Vienna, 16.80; in Budapest, 16.40; in Antwerp, 16.50; in New York, 15.94. The difference between London and Paris was, then, 8.50 fr. instead of 7 fr.

It can be said upon the authority of general experience that the tax on grains cannot raise the price of grain to its normal level in abundant years; and, on the contrary, it raises it above its normal level in poor years.

The merchants of the protected countries do not dare to buy: they prefer to wait. Furthermore, in France they fear the suspension of the tax; and thus the very persons cause the high prices who ought to lower them, for they do not provide the market. Then occur bread riots at the bakeshops. The mayors are asked to impose a tax to force them to sell their products at more reasonable price. But manufacturers are not in business in order to be ruined; and, when the mayor listens to these requests, the baker lowers the quality of his flour, and, as he knows that the sphere is a bulk with the least surface, he makes his loaves round in order to use the greatest possible quantity of water.

It can thus be said that, powerless to completely protect the grain in abundant years, the duty becomes ruinous in the years of scarcity; and whom does it injure? Laborers, the poor, all those who subsist on the least varied diet, and who, obliged to do physical labor, have not only need of nourishment sufficient for maintenance, but sufficient for work.

V. GRAIN OF THE WORLD.

If the production of grain is insufficient in an agricultural country like France, what is the case in the rest of the world? Here is the report of Levasseur on the statistics of agriculture, showing the production of wheat of the world:—

Year.	Country.	Wheat, Quintals per 100 Hectares.	Wheat, Quintals per 100 Inhabitants.
1900	Great Britain	78	39
1900	Ireland	8	40
1899	Netherlands	67	27
1900	Belgium	200	57
1900	France	233	230
1900	German Empire	109	68
1900	Austria	60	43
1900	Hungary	191	215
1900	Italy	217	108
1900	Roumania	254	254
1900	Russia	48	87
1900	Sweden	30	29
1900	Norway	11	4
1900	Denmark	36	42
1900	United States	51	186
1900–1901	Uruguay	—	15
1899–1900	Argentine Republic	—	463
	Average	106	112

Maize—of which Hungary raises 193 quintals per 100 inhabitants (without deduction of the fourth), Roumania, 366 quintals, the United States, 701 quintals—is beginning to be substituted for wheat. We ought to add a fourth of the production of wheat to the number of the population in order to get at the typical ration of the adult; we have then $112 + 28 = 140$ quintals per inhabitant. But the typical ration of a kilogram of bread per day and per capita would demand 360 quintals. The deficit is thus about 220.

Notice that this table includes wheat-exporting countries, like Hungary, Russia, Roumania, the United States, and the Argentine Republic. But, if Russia can export, it is for the reason that the largest part of her population does not use wheat. She has only 87 quintals per 100 inhabitants. Adding to this one-fourth to make up for the reduction of one-fourth of the inhabitants, we have 108 quintals per 100 inhabitants, making a deficit of 252 quintals. Out of the 132.5 millions of acres of land cultivated in European Russia, the amount devoted to wheat occupies only 12.5 millions of acres, that of rye, 28.7 million acres.

The entire region of Chernozem is cultivated, and its area cannot be extended. However fertile this black earth may be, sown thickly, 0 m. 30 centimetres to 1 metre, extensive cultivation yields only 4 or 5 grains of wheat or rye per seed. Russia exports four-fifths of her wheat crop.

In Germany 85 quintals of wheat per 100 inhabitants leaves a deficit of 275 quintals, which is not counterbalanced by the production of rye.

Except the Argentine Republic there is no country which produces a quantity of wheat sufficient to make up the typical ration of the French soldier.

According to the *Evening Corn List* the world's production during the best and poorest years is as follows:—

Year.	Million Tons.
1887	52.1
1888	61.8
1892	65.6
1894	70.0
1897	61.7
1898	78.0
1900	67.0
1901	79.7
1902	84.6
1903	86.1
1904	81.6

For the last three years the *Evening Corn List* gives the following table:—

Country.	In Thousand Hectolitres.		
	1904.	1903.	1902.
Austria	14,500	16,675	17,980
Hungary	49,300	62,930	66,120
Belgium	5,075	4,350	5,075
Bulgaria	13,050	13,050	14,500
Denmark	1,450	1,450	1,160
France	116,000	132,240	120,350
Germany	52,200	47,850	51,910
Greece	2,175	2,175	2,175
Holland	2,175	2,175	2,175
Italy	49,300	58,000	46,400
Portugal	2,030	2,175	2,175
Roumania	17,400	26,100	28,710
Russia	139,200	159,500	159,500
Caucasus	21,750	24,650	26,100
Servia	11,600	13,050	12,615
Spain	34,800	36,250	38,150
Sweden	1,450	1,450	1,450
Switzerland	1,450	1,450	1,450
European Turkey	13,050	14,500	14,500
United Kingdom	14,500	17,400	21,025
Total for Europe	562,455	637,420	634,520

Country.	In Thousand Hectolitres.		
	1904.	1903.	1902.
Algeria	9.425	8,700	10,150
Tunis	3,625	1,957	2,900
Argentine Republic	43,500	43,500	36,250
Australia	21,750	29,000	7,250
Asia Minor	13,050	12,325	14,500
Canada	31,900	38,275	34,800
Cape Colony	1,450	1,450	1,450
Chile	5,800	4,350	4,350
Egypt	4,350	4,350	4,350
India	127,600	106,575	81,200
Persia	8,700	8,700	7,250
Syria	7,250	8,700	7,250
United States of America	211,700	217,500	246,500
Uruguay	3,625	2,900	2,465
Mexico	4,350	3,625	3,045
Countries outside Europe	498,075	481,907	463,710
Grand total	1,060,530	1,119,327	1,098,230

If we separate the crops of Europe and those of countries outside Europe, we find:—

Year.	In Thousand Hectolitres.		
	Europe.	Outside Europe.	Totals.
1899	559,990	430,215	990,205
1900	548,462	402,230	950,692
1901	549,898	486,475	1,036,373
1902	634,520	463,710	1,098,230
1903	637,420	481,907	1,119,327
1904	562.455	498,075	1,060,530

It is shown in this table that the European countries produce most wheat. In the last three years the average production of Europe has been 611,500,000 hectolitres, about 55 per cent. out of an average crop of 1,092,000,000 hectolitres.

In round numbers 611,500,000 hectolitres of wheat give us 460,000,000 quintals. Reducing by a fourth the 400 millions of inhabitants of Europe, we have for each of them 1.1 quintals, while more than 3½ are needed. People who fear an overproduction of wheat may therefore be reassured. If Europe, even in prosperous times, could not procure wheat from other countries, she would suffer want. Germany was obliged in 1902 to import 2,202,000 tons of wheat; in 1903, 2,125,000 tons. She exported 262,000 and 347,000 tons. She produced 3,900,000 and 3,555,000 tons. She imported, then, more than 39 per cent. of her consumption.

The United Kingdom could not secure what was needed for its consumption without the aid of its colonies.

Year.	British Possessions.			Total of British Possessions. Tons.
	India. Tons.	Canada. Tons.	Australia. Tons.	
1895	440,000	255,000	179,000	874,000
1896	106,000	315,000	—	421,000
1897	20,000	347,000	—	376,000
1898	477,000	387,000	11,000	875,000
1899	410,000	436,000	151,000	1,032,000
1900	—	400,000	146,000	603,000
1901	167,000	429,000	310,000	975,000
1902	442,000	611,000	211,000	1,272,000

Year.	Foreign Countries.			Total of Foreign Countries. Tons.
	United States. Tons.	Argentine. Tons.	Russia. Tons.	
1895	2,266,000	572,000	1,153,000	4,489,000
1896	2,639,000	250,000	863,000	4,561,000
1897	2,707,000	47,000	756,000	4,058,000
1898	3,104,000	201,000	320,000	3,846,000
1899	3,011,000	576,000	126,000	3,893,000
1900	2,871,000	938,000	225,000	4,327,000
1901	3,343,000	415,000	129,000	4,078,000
1902	3,240,000	227,000	331,000	4,124,000

The production of wheat in the United Kingdom in 1903 was:—

In tons	1,299,000
The importation	4,406,000
Total	5,705,000

or less than 6 million tons, a deficit of 4 or 5 million tons, according to the typical ration assumed for France.

The progress of the cultivation of wheat in the United States and the total production are exhibited in the following table:—

Year.	Acres. Millions.	Bushels. Millions.
1866	15.4	152
1902	50.0	748
1903	46.2	670
1904	—	638

The population in 1860 was 31.5 millions; in 1903, 76, an increase of about 141 per cent. The production of wheat has increased more rapidly than the population, but it is found that there have been backward steps.

In 1901 the United States exported 25 per cent. of its crop, retaining 3.95 bushels per inhabitant; in 1902, 6.50 bushels; in 1903, 5.81 bushels, an average of about 5.42, or nearly 2 hectolitres; in round numbers, 1½ quintals per inhabitant. If we increase this ration by a fourth, we have, in round numbers, 190 kilograms instead of 360,—a deficit of 170 kilograms, which is supplied by maize.

If we reduce the population of the world, placing it at 1,600 millions, by a fourth, thus bringing it to 1,200 millions, it is found that there was at its disposal in 1902–04, an average year, in round numbers, 1,100 millions of quintals of wheat, about 91.6 kilograms, or less than a quintal per capita. If we consider that the French soldier's ration is represented by 400, that of the rest of the world is 100.

Wheat, then, is not in abundance. The human race, far from being surfeited with it, has not the necessary amount. It suffices to cast a glance over a planisphere showing the cultivation of the principal staples to observe that wheat-raising extends only over a very small area of the world. In the north of Germany wheat is replaced by rye, although it is cultivated farther north, both in Canada and Siberia. In the south, wheat is raised only in the northern part of India; and in the other hemisphere one must go south as far as Africa, the southern part of Australia, and the Argentine Republic, to find it.

The French, German, and English farmers who fear the influx of foreign wheat have never understood the difference between the production of wheat and the amount necessary for consumption. Among the wheat producers there are still many who are in the position of the peasant of La Bruyère.

VI. MEAT IN FRANCE.

Since the *Statistique agricole annuelle* does not give the average of butcher's meat produced, I take the figures furnished by the *Statistique agricole* for 1892 (p. 804, etc.).

Tons of meat of native stock delivered to the butcher:—

Beef	720,810 tons
Mutton	125,868 "
	846,000 "

In round numbers, 850,000 tons. But we have to provide 300 grams of untrimmed meat during 360 days for each of the 30 million inhabitants.

360 × 300 grams = 108 kilograms per year. For 30 million persons:
30,000,000 × 108 = 3,240,000 tons of meat.
Beef and mutton give us 846,000 tons of meat.
Deficit, 2,394,000 tons.

Pork to the amount of 461,000 tons must be added. We have seen that in times of peace the military ration of salt pork is 240 grams a day, but we should not include 461,000 tons of fresh pork in this reduction.

We then have:—

Butcher's meat	846,000 tons
Pork	461,600 "
Total	1,308,000 "

We have now provided for 3,240,000 rations: deficit, 1,930,000 tons, or 59 per 100.

In short, while we need 100 kilos of meat, we actually have 41. Lagrange estimated that the total consumption of meat in France was 80 pounds per capita, or about 49 kilos. More than a century later we obtain the following figures:—

$$\frac{1{,}308{,}000}{30{,}000{,}000} = 43.6 \text{ kil. per inhabitant.}$$

Is the progress in the consumption of meat in proportion to the progress of civilization made during a century?

The 5,000 to 6,000 tons of goat flesh, the 12,000 tons of horse flesh, the 36 millions of different species of fish, the 10 millions of poultry, 15 millions of rabbits, make up the quantities that I have omitted, and serve to modify the percentage under consideration to the extent of not more than 2 or 3 per 100 at the most.

Let us add fish to animal foods. According to the fish statistics for 1899, 1900, 1901, the quantity of the several kinds of salt-water fish varied between 260,000 and 280,000 tons. Adding further fresh-water fish and allowing for quantities of fish products that cannot be estimated, we get about 300,000 tons.

We must, however, deduct from this number about 40,000 tons that are exported, of which 28,000 are codfish,—thanks to a system of bounties! It can thus be said that consumption is helped out by fish to the extent of hardly more than 250,000 tons. If we make the liberal allowance of 300,000 tons, and estimate what is certainly an exaggeration of something less than a third, that the nutritive value of fish is equal to that of meat, we get 1,608,000 tons. As the necessary ration is 3,240,000 tons, the deficit is 1,632,000 tons, or 53 per 100. While 100 kilos of animal food is required, we have only 47.

The *Statistique agricole* of 1902 estimates the produce of a hen at 80 eggs per year, and the total production of eggs at 2,885,000,000 (p. 316). If the weight of an egg is estimated at 60 grams (shell included), we have for all France 173,000 tons of eggs.

M. Armand Gautier estimates that from 1890 to 1899 the average consumption of eggs by each Parisian, without distinction of age or sex, was 10 kilos of eggs. If we include 10 kilos of eggs in each of the 3,240,000 rations of animal food, the deficit in nutriment from animal matter would still be nearly half the necessary amount.

Lagrange added cheese as a substitute for meat, at the rate of a half-pound of cheese for one pound of meat; and modern writers confirm this proportion, which is, however, exaggerated for cheese in general. In 1892 the production of cheese was about 136,650 tons, not counting the amount exported. I double these 136,650 tons, and add to the ration of meat and fish 273,000 tons.

I do not include butter, which, though very rich in fat, does not contain nearly as much protein substance. When all the possible substitutes have been added to the quantity of butcher's meat and pork available according to the *Statistique agricole,* we always find a varying deficit of about 50 per 100. We can therefore maintain that in France we have only half of the requisite animal food.

VII. Increase of the Urban Population and of Animal Food.

An increase in the consumption of meat is a result of comfortable circumstances; and, if it is found that in cities the consumption of meat has not increased to the same extent as the population, the conclusion follows that meat is too expensive, and that custom duties which have been constantly increased since 1881 have their share of responsibility for this decrease in consumption. In Paris the consumption of butcher's meat has diminished in proportion to the population.

	Population.	Consumption of Butcher's Meat. Tons.	Increase in Population. Per Cent.	Increase in Consumption of Meat. Per Cent.	Kilos per Capita.
1880:					
Census of 1876 . . .	1,988,000	149,600	—	—	79
1902:					
Census of 1901 . . .	2,657,000	165,500	33	10	62
Census of 1903 . . .	—	161,762	—	8	60

Thus, while the population has increased 33 per cent., the consumption of meat has increased from 1880 to 1903 only 8 per 100; and the tariff act of July 31, 1903, was a factor in the decreased consumption of 1900 as compared with 1902.

We must add pork, poultry, game, and fish to the consumption of butcher's meat. Has this consumption increased more or less rapidly than the population?

Year.	Pork and Pork Products.	Per Cent. Increase.	Poultry and Game.	Per Cent. Increase.	Fish.	Per Cent. Increase.
1880	25,500	—	21,715	—	3,954	
1902	32,520	28	29,811	6	4,067	
1903	34,218	24	30,871	42	4,004	0.1

While the increase in population was 33 per cent., the consumption of pork relatively fell off in 1902, but became a little higher in 1903. Pork was probably substituted as food for meat of higher price in some families to compensate for the shortage of 4,000,000 tons of meat. The consumption of meat remained stationary from 1880 to 1903.

The increase in the consumption of poultry and game alone presents a greater increase than the population, but these foods rank as luxuries. The yearly ration of an adult in Paris is only 87 kilos of meat instead of the 108 kilos of the soldier. Here, then, has been no progress, but, on the other hand, a distinct retrogression.

I have made an inquiry through the mayors of some of the most progressive cities in France in order to bring the population and the consumption of butcher's meat and animal food into comparison.

Cities in which the increase of animal food has been greater than the increase of population:—

	Population.		Butcher's Meat. Tons.		Total of Animal Food. Tons.		Increase.			Per Inhabitant. Kilo.	
	1880.	1903.	1880.	1903.	1880.	1903.	Population. Per Cent.	Meat. Per Cent.	Animal Food. Per Cent.	Meat. 1903.	Animal Food. 1903.
Angoulême	30.500	37,600	2,637	3,339	3,014	3,903	23	26	29	88	103
Moutlucon	24.000	35,000	697	953	908	1,479	45	60	62	27	42
St Quentin	39,000	50,200	1,140	1,878	1,975	3,096	29	64	56	37	61
Toulouse	111,300	127,800	*392	483	——	——	14	23	—	3	—

* These figures are for 1891.

Cities in which the increase of animal food has been less than the increase of population:—

Cities	Population.		Butcher's Meat. Tons.		Animal Food. Tons.		Increase.			Per Inhabitant. Kilog.	
	1880.	1903.	1880.	1903.	1880.	1903.	Population in Per Cent.	Meat in Per Cent.	Animal Food in Per Cent.	1880.	1903.
Amiens	61,900	82,700	5,752	6,180	—	—	33	.7	—	74	—
Bordeaux	212,000	256,700	23,183	21,270	27,634	26,586	20	–8.26	–3.70	82	103
Bourges	25,200	35,900	1,546	1,547	2,175	2,450	42	0.7	12	43	6
Grenoble	44,000	39,400	4,600	5,682	5,441	7,022	35	21	29	95	11
Lille	162,700	215,400	9,551	10,264	10,698	11,736*	32	7	9	47	54
Limoges	47,500	70,500	7,100	8,812	—	—	48	24	—	124	—
Lyons	376,600	459,000	20,046	19,331	—	—	21	–3.45	—	43	—
Marseilles	273,600	491,000	26,102	30,054	—	—	78	15	—	60	—
Nantes	116,000	124,000	4,262	4,075	7,502	9,320	6	–4	24	32	75
Nîmes	60,800	72,900	5,929	5,746	6,637	6,780	19	–3	2	78	93
Rennes	44,500	61,000	3,485	3,629	—	—	37	3	—	61	—
Roubaix	83,300	124,000	3,280	4,423	4,800	5,915	49	44	23	35	47

* Not including poultry.

It will be seen that, with the exception of Angoulême, an increase in consumption of butcher's meat and animal food has occurred only in the cities where consumption was low.

But, except in Bordeaux, Angoulême, and Nîmes, this consumption never reached the 108 kilograms which, at 300 grams per day for three-fourths of the population, constitutes the typical soldier's ration.

In Toulouse the figures for butcher's meat are surprisingly small; namely, 483,000 kilos per 127,000 inhabitants, or 3 kilos per capita!

I know it is said that the rural dweller who moves to the city is used to less meat than the city dweller who has always lived in cities. Consequently, the increase in the use of animal foods should for this reason show a certain diminution compared with the increase in population. But, even taking into account this fact, we find so great a difference in certain cities, like Lyons and Marseilles, that it is difficult not to maintain that consumption has decreased. It can be said, therefore, that the high price of meat is a factor in the falling off in meat consumption.

But the duties are the one reason for the current prices. From 1863 to Nov. 3, 1881, meat was imported free of duty. A duty of 3 fr. was then imposed. The decree of Jan. 11, 1892, raised the tax to 25 fr. per 100 kilos, net weight of beef, 32 fr. on mutton, 12 fr. on pork. The decree of April, 1898, raised it to 18 fr. on pork, and the decree of July, 1903, to 35 fr. on beef and mutton and to 25 fr. on pork. The average price of meat at the Villette market, from Aug. 1–5, 1904, was (average of three qualities):—

Year.	Beef.	Veal.	Mutton.	Pork.
1904	1.40	1.68	2.01	1.41
1903	1.38	1.62	1.97	1.55
1902	1.30	1.54	1.92	1.57
1901	1.30	1.81	1.89	1.51
1900	1.20	1.58	1.80	1.47

Pork was the only article which showed a slight tendency to a lower price.

VIII. PRICE OF FOOD IN NEW ENGLAND CITIES.

Mr. Atwater has compiled food tables giving the value in calories per pound. For the commonest articles of food he has given the percentage of waste and water forming the total of undigested foods; the percentage of protein substances, fat, hydrates of carbon, and the calorie value of each article of food per pound.

Later, in conformity with the results of dietary studies in families in the chief cities and in certain population groups in the United States, his assistants have estimated the price of food compared to its nutritive value.

I take the following table from R. D. Milner's work, "Prix de l'Aliment relativement à sa Valeur nutritive" (1902 edition). The prices are the ordinary market prices in New England cities.

COMPARATIVE VALUE AND PRICE OF FOOD.

Kind of Food.	Price per Pound. Cents.	10 Cents will Buy.	
		Protein Substances. Pounds.	Energy. Calories.
Beef (filet)	25	0.064	.415
Beef (rib)	20	.081	.520
Beef (rump)	16	.088	.730
Beef (round)	12	.129	.765
Beef (culotte)	12	.114	.925
Beef (brisket)	6	.230	2.150
Veal	23	.089	.310
Mutton (leg)	14	.107	.640
Mutton (shoulder)	12	.090	1.120
Smoked ham	20	.071	.840
Bacon	14	.065	1.985
Fresh ham	12	.112	1.120
Salt pork	10	.019	3.670
Turkey	18	.092	.600
Chicken	15	.092	.520
Sausage	10	.130	2.125
Fresh salmon	35	.040	.175
Canned salmon	15	.146	.615
Fresh mackerel	12	.096	.305
Salt mackerel	8	.204	1.290
Salt codfish	9	.211	.350
Canned lobster	35	.052	.125
Fresh lobster	16	.037	.900
Oysters	18	.030	.130
Butter	28	.004	1.300
Eggs (dozen)	16	.083	.400
Cheese	16	.163	1.230
Unskimmed milk	3	.110	1.080
Cream	15	.034	1.220
Dried peas	4	.562	4.010
Green peas	3	.105	.850
Onions	3	.047	.685
Cauliflower	2.5	.043	.560
Cabbage	2.5	.056	.500
Potatoes	1.5	.120	2.070
Turnips	.1	.090	1.250
Rice	.8	.100	2.040
White bread	.5	.184	2.430
Wheat bread	.3	.380	5.490
Rye bread	.3	.227	5.480
Sugar	.6	—	3.130
Olive oil	.75	—	.565
Dates	.10	.019	1.095
Prunes	.10	.018	1.190
Raisins	.10	.033	1.120
Pears	.3	.029	.380
Apples	1.5	.027	.930

Comparing in detail New England city prices with Paris prices, we can get at the cost of the ration. If we reckon that the pound of 453 grams represents nine-tenths of a French half-kilogram, we reduce the price of filet of beef from 2.50 fr. to 2.25 fr.; the price of rib of beef from 2.20 fr. to 1.98 fr.; leg of mutton from 1.40 fr. to 1.26 fr.

If we compare French and American prices per 100, we find the French price for filet is higher by 80 per cent.; for rib by 98 per cent.; for leg of mutton by 80 per cent. Therefore, the amount of protein substances and calories that I could buy in the cities of the United States for 10 cents (50 centimes) would in Paris cost 0.90 centimes, 0.99 centimes, and 0.90 centimes, respectively.

The same calculation can be made for all the other foods I have enumerated in the above table. Any housekeeper can compare New England city prices and those of Paris on the basis of this table.

An adult in Paris, taking a moderate amount of exercise, would not have half his necessary ration by paying 2.79 fr. for the specified cuts of meat.

According to the study of five groups in Chicago, we give the cost of living for one workman per day:—

	Average per Day. Cents.	Protein Substances.	Calories.
(*a*) Americans	26.1	117	3,623
(*b*) Americans of German descent	21.0	109	3,070
(*c*) Germans	24.8	125	3,552
(*d*) Irish	25.9	131	3,660

The average price of food is thus 1.25 fr. to 1.30 fr.

In New York the dietary studies made by Mr. Atwater and Mr. P. Bryant, using the same methods, give the following results for 6 groups of men:—

	Cents.	Protein Substances. Grams.	Calories.
Group A, less than 13 cents per day, average	11	75	2,151
Group B, from 13 to 16 cents, average	15	94	2,779
Group C, from 17 to 20 cents	18	103	2,944
Group D, from 21 to 23 cents	22	125	3,514
Group E, from 25 to 28 cents	26	138	3,864
Group F, more than 28 cents	38	178	5,432

It is evident that the men in group A are far from having a ration sufficient for sustenance, much less for enduring labor.

These figures prove that there are persons in Chicago and New York who live very scantily, but that for 1.30 fr. they can secure a ration much superior to that of the French soldier, and for 1.90 fr. a luxurious one.

The high cost of living in the cities of the United States should be studied in connection with the high cost of living in England.

IX. CONSUMPTION OF MEAT IN THE UNITED KINGDOM.

The production of animal food in the United Kingdom is not sufficient for its consumption.

According to an inquiry made in November, 1900, by a committee appointed by the Royal Statistical Society to estimate the production and consumption of meat and milk in Great Britain, the average yearly quantity of meat consumed and produced during the five years ending May 31, 1903, was as follows:—

	Tons.
Beef and veal	662,520
Mutton	313,822
Pork and ham	269,578
	1,245,920

We learned that the production in France was 1,308,000 tons. The English ton is equal to 1,016 kilos. But, since the population of Great Britain exceeds 41,000,000, the deficit would be greater than in France. If 100 kilos of meat were necessary, they would have less than 40 kilos.

The table of per capita consumption gives 67.5 pounds, which equals 30 kilos, 577 grams. But, as we count the consumption of only three-fourths of the population, we must increase the ration by a fourth to obtain the same ration employed for France. We get thus 38 kilos, 220 grams.

The consumption of imported meat is given as 54.3 lbs. per capita, about one-fifth less than the home product. We thus get 30 kilos, 600 grams. Imported meat gave 961,905 tons, or 54.24 lbs. per capita. The total is 2,207,000 tons.

The total English ration calculated on the same basis as the ration considered typical for France is 68 kilos, 800 grams; in round numbers, 69 kilos, exceeding that of France by 25.4 kilos.

This amount of 2,207,000 tons leaves a deficit of more than 1,000,000 tons. While in France the deficit is at least 50 per cent., in the United Kingdom it is only 30 per cent., thanks to the exemption from import duty on meat. These figures prove that the English are wise in increasing the area of their meadows, since they provide for only 56 per cent. of the consumption of their population, while an additional 30 per cent. is needed.

In the second report of the committee we get the subdivisions of consumption of meat per capita in England:—

			Pounds per Capita and per Year.
Group	I.	Laborers, mechanics, farm hands	107
"	II.	Population of small means	122
"	III.	Population of moderate means	182
"	IV.	Population of large means	300

Again we should note carefully these groups. It is evident that those having to expend the greatest physical energy can, with the least success, make good this loss. They have less than 69 kilos of meat, and the French soldier's ration is 108.

X. Amount of Animal Food in the World.

I take from M. Levasseur's analysis of "Les Procédés de la Statistique Agricole" the following table of domestic animals, and compare it with the population of different countries taken from the Census of 1900:—

COMPARATIVE STATEMENT SHOWING THE AVERAGE NUMBER OF DOMESTIC ANIMALS FOR THE DECADE 1891-1900.

(In Millions of Heads.)

Countries.	Cattle.	Sheep.	Hogs.	Inhabitants. Millions.
Great Britain	6.6	27.0	2.5	41
Ireland	4.4	4.3	1.3	
Netherlands	1.5	0.7	1.1	5
Belgium	1.5	0.24	1.0	7
France	13.3	21.1	6.2	39
German Empire	18.3	11.4	14.5	56
Austria	9.0	2.9	4.1	45.4
Hungary	6.7	8.1	7.3	
Italy	5.0	6.9	1.8	33
Roumania	2.5	5.0	0.9	6
Russia (European)	30.3	47.2	11.2	100
Sweden	2.5	1.3	0.7	5
Norway	1.0	1.2	0.1	2
Denmark	1.7	1.2	1.0	2.5
United States (according to the Census of 1900)	67.8	61.6	62.9	80
Totals	172.1	200.14	116.7	322

What food resources do these figures indicate? What weight of meat does each of these animals represent? The committee of the Royal Statistical Society, after very careful study, reached the following conclusions: an ox is equal to 660 lbs. of meat; a calf, 95 lbs.; a sheep, 65 lbs.; a lamb, 40 lbs.; and a hog, 135 lbs.

But the English products are of much better quality than those of other countries. Furthermore, the oxen and calves are lumped together as well as the sheep and the lambs. In order to obtain an average weight, I have deducted a fourth of the weight for the English cattle and sheep as given by the committee. I deduct, however, only a fifth of the weight of hogs, with the following results:—

	Weight in Kilos.	Millions of Heads. Multiplied by	Metric Tons of Meat.
Cattle	224	172	38,528,000
Sheep	21.5	200	4,300,000
Hogs	50	116	5,800,000

But this amount is not annually at hand. It was necessary to take a period of five years for beef, of four years for mutton, and of two years for pork, which gives us:—

Cattle	7,700,000	tons annually.
Sheep	1,080,000	" "
Hogs	2,900,000	" "
Total	11,680,000	" "

We should deduct a fourth of the 322 million inhabitants used in this table, or about 80. We then have:—

$$\frac{\text{Tons of meat, 11,600,000 kil.}}{\text{Number of inhabitants, 242,000,000}} = \text{48 kilos.}$$

$$\frac{\text{Kilos}}{\text{Number of days}}\ \frac{48}{360} = \text{133 grams per day.}$$

It will be remembered that the French military ration is 300 grams. The discrepancy is therefore 167 grams. If the inhabitants of these countries were to have a ration equal to that of the French soldier, 225 grams would have to be added to every 100 that they really have.

By taking the figures compiled under the auspices of the committee of the Royal Statistical Society, I get the following table of the average consumption of *meat* and products of the dairy in different countries:—

	Meat. Pounds.	Milk. Gallons.	Cheese. Pounds.	Butter. Pounds.
United Kingdom	122	15	10.5	18.5
Denmark	76	40	—	20.0
France	80	16	8.2	5.9
Germany	99	—	—	—
Saxony	—	46	—	33.0
Belgium	70	—	—	25.0
Holland	—	—	11.0	13.0
Sweden	62	40	4.6	15.8
United States	150	25	3.7	20.5
Australia	262	—	3.5	16.7
New Zealand	212	—	4.4	17.8

The figures of 150 pounds of meat for the United States give us 67 kilos, 5 grams. Increased by a fourth to get the figure for the adult's ration, we have 83 kilos, 3 grams, per year instead of the 108 kilos of the typical ration. This figure is exceeded only in Australia and New Zealand. For Australia we have 118 kilos, which, increased by a fourth. gives 156 kilos per adult ration.

XI. Population and Foods.

In England, Major Craigie, president of the Royal Statistical Society in 1903 and 1904, has called the attention of his colleagues to the enormous increase in the world's population. It has not doubled in twenty-five years; but he estimates with most other statisticians that it has nearly doubled in the last seventy years, increasing from 850 millions to 1,600 millions, the estimate of M. Levasseur and M. Bodio.

Increase in Population from about	1830 to 1900. In Millions.	
Europe	216	400
Asia	480	868
Africa	109	178
America	40	148
Oceanica	2	6
	847	1,600

Russia's population is included in the figures for Europe. Its population has probably increased 150 per cent. in seventy years, and that of the rest of Europe 67 per cent.; but up to 1897 she had no census that could be trusted. Excluding Russia, the population of Europe has increased by more than one-half.

POPULATION.

Countries.	1830.	1900.	Per Cent. of Increase in 70 Years.
United Kingdom	24.4	41.6	70.5
France	32.5	38.9	19.7
Germany	30.0	56.4	88.0
Austria-Hungary	30.0	45.4	51.3
Italy and Switzerland	23.2	35.8	54.3
Spain and Portugal	14.2	23.1	62.7
Sweden, Norway, Denmark, Belgium, and Holland	12.4	21.7	75.0
	166.7	262.9	57.7

We have seen that, in spite of the progress of agriculture. sufficient food could not be produced.

XII. THE ECONOMIC OLIGARCHY IN FRANCE.

That it exists is to the condemnation of German, French, and Belgium agrarians. They intend to get a monopoly of the food consumed by their countrymen, and they are incapable of securing it.

I refer to the distinction made between protective and fiscal tariff.

A fiscal tariff, such as was established in England in 1860, strikes only at the articles which the country does not produce. The entire receipts go into the treasury to provide for expenses of public interests.

A protective tariff is, on the contrary, fixed on articles produced by the country. The object is not to increase the receipts of the treasury, but to raise the price of articles produced, and consequently to make all consumers of these products pay the difference between the natural market price and the price obtained by means of this device.

The duty on wheat proposes to raise the price of all quintals of wheat which are on the market 7 francs; and 0.07 centimes a kilo of wheat = 0.7 centimes a kilo of bread. Thus every loaf of 2 kilos is taxed 14 centimes. We may estimate at 70 millions the quintals of wheat imported into France subject to the customs duty. If the full expectation of 1897 and 1898 had been realized, the consumers would have paid an over-assessment of 490,000,000 francs. If the average tax were only 4.90 fr., or 5 fr., as fixed by M. des Essars, we get, year in and year out, a tax of 35 millions, which affects all persons obliged to buy their bread in proportion to the amount of bread they use. Although the price of meat continues to increase, a deputy, M. de Bussy, does not think sufficient the tax of 10 fr. on 100 kilos of beef, live weight, and 15.50 fr. on 190 kilos of live-weight mutton. He secured the necessary votes for the decision of July 31, 1903, fixing the tariff as follows:—

	Maximum Tariff.	*Minimum Tariff.*
Cattle, per 100 kil. (live weight)	30	20
Calves	40	25
Sheep	40	25
Hogs	25	15
Fresh meat: mutton	50	35
Beef	40	35
Pork	40	25
Ham	50	30

This tariff indicates that 20 fr. on live weight was considered equal to 35 fr. on fresh meat, not distinguishing between choice and poor cuts. At the minimum, then, the tariff affects fresh meat at the rate of 0.35 centimes a kilo, bones included, about 350 fr. a ton, which multiplied by 1,300,000 gives 450,000,000 francs. We have, therefore, more than 805,000,000 francs levied through the customs duty on bread and meat.

These 800 millions are added to the 300 millions of taxes that we pay into the State Treasury, but the mysterious 800 millions that are added to the price of articles which every housewife must use daily, and the expenditure of which no one controls, are not used to insure the expenses of common interests. They are used for private revenue to guarantee and increase the income or profit of a certain number of persons who, in a country enjoying universal suffrage, more than a century after the Revolution had abolished feudal rights, have known how to uphold for their own profit this contradiction between private interests and sovereign rights. In some way they arrange for two salaries, a nominal and a real salary, the former being increased from the private or feudal tax, and imposed for the profit of land-owners and protected industries. Some large owners, calling themselves farmers, with as much reason as a householder letting a store to a grocer can claim to be a grocer, exclaim that, without a duty on cereals and meat, the land will lie fallow, agriculture be ruined, and farm hands be without work; and they are the self-same persons whose cry always is that the farms are short of laborers.

This argument, dating from 1819, has often been revamped. In 1851 M. Thiers made dire predictions of what would happen if a government should ever be bold enough to suppress the sliding scale (of taxes). But from 1861 to 1889 the duty on wheat was 60 centimes per 100 kilos. The number of hectares sown in wheat rose from 6 to 7 millions in 1869. It remained at this figure even after the war. The maximum crop was, under the régime of the sliding scale of taxes, 110 millions of hectolitres in 1857, 116 in 1863 and 1868. It rose to 121 in 1872, to 133 in 1874, to 122 in 1882, the last year of economic freedom for wheat. And since then, in spite of the duties of 3 fr., 5 fr., and 7 fr., and in spite of the progress of science, no crop has equalled that of 1874.

Let us admit that the French land proprietors would have been incapable of doing what the Danes did under pressure of competition.

Let us admit that, if the tax of 7 fr. had not existed, the owners of land which produced enough wheat to sell would have the 350 millions paid by the purchasers of wheat, and consequently by the consumers of bread.

Let us admit that, without the tax of 25 fr. per 100 kilos of fresh meat, increased to 35 fr. by the law of July 31, 1903, the owners of pastures would lose a sum that we estimate as equal to that paid by the consumers of wheat. This would be a loss of 700 millions to them. But the whole question is to find out who ought to bear the loss.

Should a deficit resulting from an accident, such as too much or too little rain, high price of fodder or low price of produce, home or foreign competition, ignorant cultivation of the soil, etc., be borne by land-owners, who also run the chance of improving the value of their land? or ought it to burden the persons who, having no share in the management of affairs, have no more interest in the chances of gain than in the risks of loss? What have the legislators done by placing a duty on wheat? They believe, perhaps, and have persuaded public opinion, which is ill-informed on economic questions, that they would obviate the loss resulting from foreign competition. Not at all. They have made the consumers of bread shoulder this possible loss; that is to say, the most numerous class whose diet is least varied, wage-earners of all kinds. And they have cut down the meat ration of those who ought to play the largest part in keeping up the population.

By aid of the law they have taken from the purse of those who by their daily labor ought to provide for themselves and their families, and to save part of their wages for a rainy day; and for whose profit? For the profit of the owners of 138,000 farms of more than 40 hectares, some of whom raise no wheat; for the profit again of the owners of 711,000 farms of from 10 to 40 hectares, not all of whom raise wheat. In other words, for the profit of a very small minority, since the owners of small farms under 10 hectares can hardly transport their wheat to market.

The 138,000 large estates include 10,143,000 hectares of arable land, perhaps of 73 hectares each on an average; the 711,000 medium-sized estates of 8,368,000 hectares, of about 11½ hectares each on an average.

On account of the necessary triennial rotation of crops, these can plant about 4 hectares in wheat at a time, reaping 45 quintals, of which they can sell about 35 without being obliged to buy for their own use. There are two classes of land-owning wheat sellers; but the 2,617,000 owners of land of from 1 to 10 hectares have all told only 6,654,000 hectares of arable land, less than 3 hectares apiece, of which 1 hectare at most can be put into wheat each year, and which will yield 14 to 15 quintals a hectare in good years, of which more than two-thirds must be kept for their own consumption. As for the 2,235,000 small owners of less than a hectare, who hold, all told, 719,000 hectares, they buy wheat and sell none.

Since many farmers who sell wheat buy baker's bread instead of making their own, they are sure to suffer a loss on account of the tariff; for the baker not only makes them pay the tax on the bread, but the wheat merchant, the miller, and the baker get also their profit out of the resulting high price of wheat. They do not distinguish in the price the part resulting from the tariff and that representing the normal cost.

If the tariff is equal to 4.90 per cent. per quintal, and the wheat merchant profits 10 per cent., the flour merchant 10 per cent., the baker 10 per cent., then the farmer who buys his meal has to pay for protection 30 per cent. of 4.90, or 1.47.

Is it in the interest of public well-being that the proposal of M. Debussy, made a law July 31, 1903, raised the duty on wheat? Is it for the benefit of the majority of families? Is it for the benefit of those who, dependent on their own physical exertions, need solid nourishment? No, it is always for the benefit of the owners of 138,000 large estates, consisting of 2,039,000 hectares of meadows; for the benefit of the owners of the 711,000 medium-sized estates, which include 2,388,000 hectares of meadows. For the small property owners, having less than 10 hectares, number only 2,129,000.

	Arable Lands per 100 Hectares.	Total.	Meadows.	Total.
Small farms:				
Under 1 hectare	2.78	28.49	3.20	32.47
From 1 to 10 hectares	25.71		29.27	
Medium-sized or large farms:				
From 10 to 40 hectares . . .	32.33	71.51	36.43	67.53
Over 40 hectares	39.18		31.10	

Thus the medium-sized and large estates contain more than two-thirds of the meadow land and nearly three-fourths of the arable lands.

The agricultural tariff benefits only the smallest minority; and I mention the fact more gladly, as I belong to it.

XIII. CONCLUSIONS.

First. All protection tends to an oligarchy. It exists for the benefit of a privileged minority and at the expense of all.

Second. Agricultural protection in France burdens the population much more heavily because there is a shortage of 30 per cent. in wheat and of 50 per cent. per 100 in animal food, if we take the soldier's ration in time of peace as a standard for our adult ration.

Third. Agricultural protection can profit only the large land-owners.

Fourth. The cost of food in France is much higher than in the United States and Germany.

Fifth. The amount of wheat and meat produced in the world is much less than is required for food, as physiologists, including Atwater, have proved.

Sixth. The increase of population in Europe during the last seventy years has been so great that without importations of wheat and meat it would be in want.

Seventh. Many who need nourishing food must have very insufficient nourishment.

Eighth. The relative decrease in the consumption of meat in a majority of the large French cities proves that evil results from the duty which actually raises the price 35 centimes per kilogram.

NOTE.

To the conclusions arrived at in regard to France, I add the following conclusions which especially concern the United States:—

First. The United States can increase their production of wheat and meat to an amount sufficient for their home consumption and for exportation.

If the continent of Europe by loss of capital should be forced to reduce its consumption on account of reduced purchasing power, it would have more and more need of nutritive articles, whatever may be the increase of its own agricultural production.

This the following table from the *Annual Review of Foreign Commerce* for the year ending June 30, 1904 (p. 23), proves:—

	Exports of Wheat. In thousands.			Exports of Flour In thousands.		
Years.	To Europe.	Total Exports.	Per Cent. to Europe.	To Europe.	Total Exports.	Per Cent. to Europe.
	Bushels.	Bushels		Barrels.	Barrels.	
1894	83,987	88,415	94.99	11,840	16,859	70.23
1895	71,794	76,102	94.34	10,133	15,268	66.36
1896	52,908	60,650	87.24	9,201	14,620	62.94
1897	67,512	79,562	84.85	9,234	14,569	63.38
1898	135,547	148,231	91.44	10,608	15,349	69.11
1899	128,202	139,432	91.95	12,600	18,485	68.16
1900	96,995	101,950	95.14	12,665	18,699	67.73
1901	119,796	132,060	90.71	13,108	18,650	70.28
1902	140,338	154,856	90.63	11,826	17.759	66.60
1903	93,724	114,181	82.08	12,690	19,796	64.10
1904	40,245	44,230	90.99	10,534	16,999	61.97

Exportations diminished greatly in 1903 and 1904, but except in 1904 they are higher than in 1896 and 1897, but what should be noticed is the constancy of the proportion of wheat exported to Europe during these ten years, which has kept at about 90 per cent.

Second. The characteristic distinction between protection in the United States and protection in France and Germany is that in the latter countries it does not apply to other foodstuffs than wheat and meat. In addition the position of the American workman is vastly superior, since he can have at the lowest price the foodstuffs he most needs.